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**Assessing agri-business firms' performances:**

**Organizational and marketing business models of high/low sales and ROE outcomes**

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## **Assessing agri-business firms' performances:**

### **Organizational and marketing business models of high/low sales and ROE outcomes**

#### **Abstract**

Business models are configurations (i.e., recipes) that influence firm's success or failure. Asymmetric theory can be useful for describing recipes that express outcomes of success or failure. This study analyzes data from a survey of senior executives in 247 South and Central American firms. Questions measure strategy elements and success of the firm. Conventional business measures success using sales and return on investment. The model breaks strategies into two groups, organizational and marketing. The study focuses on recipes of each strategy group that produce both high and low sales and high and low return on equity. The recipes show that configurations of organizational and marketing strategies are excellent predictors of high sales but only good predictors of high return on equity. The model shows that organizational strategies can predict high presence of the marketing strategies. Own brand share proves to be a necessary marketing strategy in predicting high ROE and high sales warranting further research into what organizational strategies are high predictors of own brand share.

Keywords: asymmetric, business model, configurations, recipes, strategy

## Introduction

This study explores organizational and marketing configural recipes that result in high or low sales and high or low return on equity (ROE). Conventional business measures success on high levels of sales and profits, but there is a heated debate about the strategies that can generate high sales and profit performance (Campbell-Hunt, 2000; Grant, 2008). This study uses data to identify six organizational strategies and six marketing strategies to predict high or low outcomes of sales and ROE. The study uses asymmetric theory to identify recipes from the chosen strategies. The study contributes to current research in two ways. First, the study introduces asymmetric theory and the use of configural recipes to predict high or low sales and ROE, building on the research agenda on agribusiness strategy set, among others, by Brenes, Montoya and Ciravegna (2014). The study shows how organizational and marketing strategies can combine to create a positive or negative outcome. Second, the study contributes to the literature on organizational behavior (Acquaah and Yasai-Ardekani, 2008; Dhamvithee, Bhavani, Jangchud, & Wuttijumnong, 2005; Shah and Ward, 2003;): the findings hereby presented corroborate the arguments of Fiss (2011), illustrating the complex and non-linear relationship between strategy and performance. Third, studying firms from Latin America responds to calls for more research on this under-represented area of the world, which, in the field of agribusiness, plays a key role in the world economy (Aulakh & Kotabe, 2000; Brenes, Ciravegna, & Montoya, 2015; Nicholls-Nixon, Davila, Sanchez, & Pesquera, 2011)

This study is important because it describes complex organizational strategies as complex recipes of antecedent conditions that can better define what organizations can do to sell more or produce more profits. Second, the study shows how different recipes of organizational strategies can be used to predict the presence of marketing strategies within a firm. This model

of complex conditions is valuable to organizations because the approach sheds light on which organizational strategies work well, or poorly, with which marketing strategies and how do these individual strategies produce outcomes relating to sales and ROE.

Section two discusses the theory behind fsQCA and asymmetric analysis. Section three discusses the data and how these data were collected. Section four describes the modeling effort, its configuration, its strengths, and its shortcomings. Section five presents the findings and a discussion of what future analysis could focus on to increase understanding of accounting for complex configurations of business models and the outcomes of such models. Exhibits display analysis displaying all antecedents used in predicting the outcomes and XY plots of all significant findings.

### **Asymmetric Theory**

Multiple regression analysis (MRA) and additional symmetric tests dominate management research. Recently research focusing on the use algorithms is proving to be useful alternative theory construction and data analytical tool. Asymmetric analysis is founded on the observation that in research a mismatch of theory and analysis is occurring in management research. Fiss (2007) points out that current organizational theory builds from the use of configurational approaches that exhibit equifinality depending on arrangement while the tools used to analyze the data provide linear solutions that exhibit unifinality. To describe relationships MRA is dependent upon key statistical operations such as correlation, variance, and mean. Scholars such as Anscombe have pointed out the problems associated with these key concepts. Anscombe's quartet (Anscombe, 1973) appears as Figure 1. Figure 1 displays four distinct XY plots. Though the plots are strikingly different in appearance they all have the same means, variances, and correlations. Fiss (2007) points to a set theoretical approach to resolve the

mismatch. A set theoretic approach uses Boolean algebra to determine which combinations of antecedents combine to create the desired outcome (Ragin, 2008). A set theoretic approach is based on the theory of set membership. The algorithm this analysis uses is the Quine-McCluskey algorithm. The program fsQCA employs the Quine-McCluskey algorithm to identify complex combinations, or recipes, that reach the desired outcome.

Figure 1 here.

Set-theoretic analysis boils down as follows: data gathering, set membership, calibration, use of Boolean algebra operations, and fsQCA. The observer must gather relevant data from which to analyze configurations of relationships in cases rather than net effects of individual variables. Using fsQCA the research needs to frame the data to establish membership in the set. The degrees of membership depend on the calibration. For example, consider if s/he are short ( $\sim T$ ) s/he is fully out of the set. In the present study we use fuzzy set analysis to further define degrees of tall ( $T$ ). If the median height of all the participants is 5' 10" the observer calibrates the antecedent ( $T$ ) to further describe that information.

|                       |     |                      |
|-----------------------|-----|----------------------|
| Fully Tall            | .95 | heights above 5' 10" |
| Neither Tall or short | .50 | height = 5' 10"      |
| Negation of Tall      | .05 | heights below 5' 10" |

This calibration provides the observer with relevant data that is interpretable and useful in performing fuzzy-set computations via Boolean algebra.

After all data has been calibrated the observer is able to analyze using the fsQCA.com program (Ragin, 2008). The analytical tool, fsQCA.com, applies Boolean algebra to estimate the useful recipes that indicate outcomes of interest (e.g., high ROE or the negation (low) ROE).

This analysis is strict in that fuzzy-set operation returns the lowest value of all the combinations

of antecedents as the outcome score for that combination. For example, if there are three antecedents and the scores are: 0.50, 0.95, 0.05, the outcome score for this combination, or recipe, is 0.05. The recipes are then measured for consistency and coverage. Consistency should be greater than 0.70 to be considered useful and 0.85 to be considered a strong indicator of the outcome of interest (cf. Ragin, 2008). Consistency is a measure of how often a high value of X returns a high value of Y. Coverage is broken down into two parts, raw and unique. Coverage is relevant in two ways. First, high coverage explains the masses. High coverage indicates that the analysis has identified a model that predicts the desired outcome that is relevant for many cases. Second, low coverage identifies hidden gems (Ragin, 2008). Low coverage indicates that the analysis has found a model that predicts the desired outcome but is relevant for only a few cases. This perspective is useful in business as it could identify a successful business model that is not in use widely. If implemented this business model might exploit a gap in the current market.

### **The Data**

The present study focuses on data gathered from 247 agribusinesses in Central and South America. Data were collected through two methods: telephone interviews and online questionnaire. The companies were targeted through Industrial Chambers, Commercial Guides, and Agriculture Ministries. Their response rate was 31.3 percent. The present study adds value to this data by organizing and combining key antecedents to better understand the strategies these companies share that create success or failure.

The present study included splitting the data into two samples by selecting every other company and placing those in one file then using that file as the sample. The second file was held and used for the purpose of proving predictive validity. The present study does not analyze the data in symmetric ways to compare the results of symmetric analysis with asymmetric

analysis. Future studies could benefit from such a comparison. The present study does use fuzzy sets to combine antecedents with the anticipated result of further understanding firm strategy.

For example, the antecedent Pay Low and Sell Hi is a fuzzy “and” of the antecedents prices\_sells and not prices\_paid. Meaning the study uses Boolean algebra to combine negation of prices paid for their purchases relative to their competition and the prices they sell their products for relative to their competition. The resulting antecedent is a representation of a firm strategy that involves high margin sales.

### **The Model**

The present study includes 35 possibly relevant antecedents with which to analyze. The present study applies business experience to organize the antecedents into strategic categories. The Model displays the results in Figure 2. Organizational strategies make broader company decisions that affect efficiencies, supply chain and employment practices. Marketing strategies decide who the company sells too, what they sell, where they sell, and the proportions of each. All companies make these decisions with the desired outcome of sales and profitability. The present study explains what causal recipes can be derived from the organizational and marketing strategies to provide both high and low outcomes of sales and ROE.

Figure 2 here.

The present study identifies organizational strategies to be: employment based, the percentage of permanent employees to total employees, supply chain based, the extent to which a company is vertically integrated, innovation based, the extent to which a company invests in future products, community based, the extent to which a company focuses on corporate social responsibility, financial based, the extent to which a company focuses on the proportion of debt to equity, and planning based, the extent to which a company plans for the future.



Organizational strategies are important to a company's success because they determine the hierarchy of all decisions underneath. Organizational strategies drive the message down to the departments and ultimately drive the company. The present study shows that organizational strategies are very good predictors of the outcome sales and relatively good predictors of the outcome ROE. The present study identifies the following antecedents as organizational strategies: vertical integration (vert\_int\_c), formal strategy (formal\_strat\_c), R&D to sales ratio (r\_d\_sales\_c), liabilities to equity ratio (liab\_equit\_c), percentage of permanent employees to total employees (permshare\_c), and CSR certificates (csr\_certs\_c). The presence or absence of these six antecedents provides insight into each corporation's business philosophy. Vertical integration provides insight into the supply chain strategy of the firm. The more a firm is integrated the more control the firm has over its value chain. Control can come at a cost; however, control often provides advantages. The presence or absence of a formal strategy gives insight into the formal hierarchy of an organization. Formal procedure is often present in mature firms that need structure to organize all employee's efforts. R&D to sales ratio provides insight into the firm's investment in the future. Presence or absence of investment in R&D provides insight in the firms risk tolerance. Liabilities to equity ratio is a long held marker of a firm's continuance or financial health. Firms steep in debt are often looked at as not long for this world. Corporate social responsibility investments are becoming a trend in the agricultural marketplace, i.e. Starbucks campaign for farmers in South and Central America. Investment in CSR is a clear strategic decision. Presence or absence of a high share of permanent employees provides insights into a firm's strategic decision to invest in human capital. Often this strategy can save hard dollars while causing a loss of efficiency that is hard to measure.

The present study identifies marketing strategies to be selling strategies. These strategies identify, how many markets, how much of their product the company will sell, how much of the selling process the company will own, breadth of product line the company will sell, and how high the margin will be on the product. Selling strategies are important to a company's success. Consider the study by Woodside, Schpektor, and Xia (2013), they analyze selling strategies relevant to a relatively frivolous product, DVD cleaner, and they show that selling expertise and conditions surrounding the customer do affect outcome. The present study shows that marketing strategies are very good predictors of the outcome sales and relatively good predictors of the outcome ROE. The present study identifies the following antecedents as marketing strategies: product range (prodrange\_c), new products new processes (newprodproc\_c), direct share (direct\_share\_c), own brand share (ownbrand\_shar\_c), pay low sell high (paylo\_sellhi\_c), and markets (markets\_c). The presence or absence of these six antecedents provides insight into the corporations marketing plan. Presence or absence of product range has an impact into the selling philosophy and marketing plan to support. Presence or absence of new products and new processes can provide insight into whether the firm focuses on few lines or many. The proportion of direct share provides insight into how the company distributes its product to the consumers and provides a further understanding of their value chain. Presence or absence of selling own brands in the market indicates to a firm's brand equity strategy. The participation of one or multiple markets affects how nimble a company must be to adjust to each market. The strategy of selling high margin items requires quite a bit of marketing support backed by a known brand superiority.

This model has shortcomings that relate to compilation. Direct share is a value chain strategy and should be placed with the organizational strategies. Similar arguments could be

made for own brand sales. Future analysis should consider other compilations that could either prove or disprove this shortcoming.

## **Findings and Discussion**

The present study's model shows strengths and short comings in each arrow. In Figure 3, Arrow A is strong when predicting outcomes relative to markets (Table 1), new products and processes (Table 2 and Figure 4), and pay-low, sell-high (Table 3 and Figure 5), and product range (Table 4 and Figure 6). The weaknesses were present when trying to predict direct share or own brand share. This model makes sense as the organizational strategies are large sweeping organizational decisions and they are highly likely to strongly influence the recipes necessary to create a company's breadth of product line or market penetration. Both markets and product breadth were predicted accurately by the complex antecedent configurations.

Figure 3-7 here.

Tables 1-4 here.

The current study performed using the fuzzyand function to combine product range and markets then running an analysis using fsQCA with the new antecedent pr\_mkt\_c (Table 5 and Figure 7). These findings include high consistency, greater than 0.90. This study concludes that organizational strategies can predict marketing strategies. It would be interesting to know if this is a chicken or the egg analysis.

Table 5 here.

Consider that organizational strategies and marketing strategies are strongly tied and often formed at the same time by the same leaders of an organization. Future studies should focus on development of these strategic decisions and which components are done in what order.

This analysis would provide great insight into how decisions are made that ultimately become high predictors of high sales and high ROE. Future studies should also focus on which antecedents would accurately predict the proportion of direct share to end consumers and own brand sales. Insight into the antecedents that accurately predict such marketing strategies may be further from the executive leadership that traditionally institute strategy.

Arrow B is a strong predictor of high sales with no one antecedent proving to be necessary or sufficient. See the Table 6 Arrow B findings to examine the results. Seven possible recipes were included in a complex solution all showing consistency greater than 0.90. Much research has been devoted to proving organizational strategies are excellent predictors of sales. What was interesting is that not one antecedent was necessary or sufficient. In order to predict high sales the firms have to have a recipe of organizational strategies. This finding further supports the use of asymmetric analysis as traditional MRA is not able to handle the concept of equifinality.

Table 6 here.

Arrow B is a good but not excellent predictor of high ROE (Table 7 and Figure 9). Organizational strategies are good predictors of sales because they drive and organize the organization into a common direction. This driving force, when in place, often leads to other successes such as profits. This perspective is one possible explanation as to why the organizations are less likely to predict high profits.

Table 7 and Figure 9 here.

Taking the analysis further the current study considered how the organizational strategies predict a combination of high sales and high ROE (Figure 11) or low sales and low ROE (Figure

10). The study shows that Arrow B can accurately predict the death of an organization, low sales and low ROE. The study shows that Arrow B is not a good predictor of high sales and high ROE. The study did analyze the idea of a successful small scale organization, low sales high ROE, but no useful model was found. Future analysis should focus on the finding the organizational strategies that can accurately predict high sales and high ROE as well as low sales and high ROE. The contribution of such a study could lead to development of business strategies unexplored but yield excellent results across all scales of business.

Arrow C is a strong predictor of high sales with product range proving to be necessary but not sufficient (Table 8 and Figure 12). The consistency of all models are greater than or equal to 0.90. The coverage for all models are at or exceeding 0.19. Considering the data set is made up of agricultural businesses it is reasonable to presume that product range is the marketing strategy necessary in predicting high sales. The more products offered the greater the opportunity for sales.

Table 8 and Figure 12 here.

Arrow C is a strong predictor of high ROE with own brand share and markets proving to be necessary but not sufficient (Table 9 and Figure 13). When you consider the agricultural nature of the data set own brand sales and markets as necessities is not surprising. Selling your own brand takes out the middlemen and creates higher profits. Selling your products in more markets creates more opportunities to generate those profits. Surprising is that the second recipe shown in Exhibit 3: Arrow C findings shows a recipe in which product range is not a necessity to create high ROE. This finding implies that as you scale up you may lose return on those sales.

Table 9 and Figure 13 here.

The present study tests Arrow C against high sales and high ROE (Table 11). Marketing strategies are not good predictors of low sales and low ROE (Table 10) however they are useful antecedents in creating a recipe for high sales and high ROE. Two recipes appear in Table 11. These two recipes differ only in direct share and pay low and sell high. One model shows these two antecedents negated and the other shows them as present and not negated. The most interesting insight from this analysis that marketing strategies are better predictors of high sales and high ROE than organizational strategies. Own brand share is the differentiator. The present study could not identify the organizational strategies that are good predictors of own brand share but it did prove that own brand share is a necessary marketing strategy to predicting high sales and high ROE. Refer to the previous point made in Arrow B, future studies should focus on identifying those organizational strategies.

### **Conclusion and implications for future research**

The present study brings insight into how organizational strategies predict marketing strategies, how marketing strategies predict success, and how organizational strategies predict success. Future studies should focus on what organizational strategies predict high own brand share. Own brand share is a useful predictor of high sales and high ROE as well as high ROE. This is interesting and merits further research. Future studies could include using the same data set to run traditional MRA and compare the findings for fit and predictive validity. The future studies should compare the results of this study to that of the traditional MRA analysis to further cement the findings.

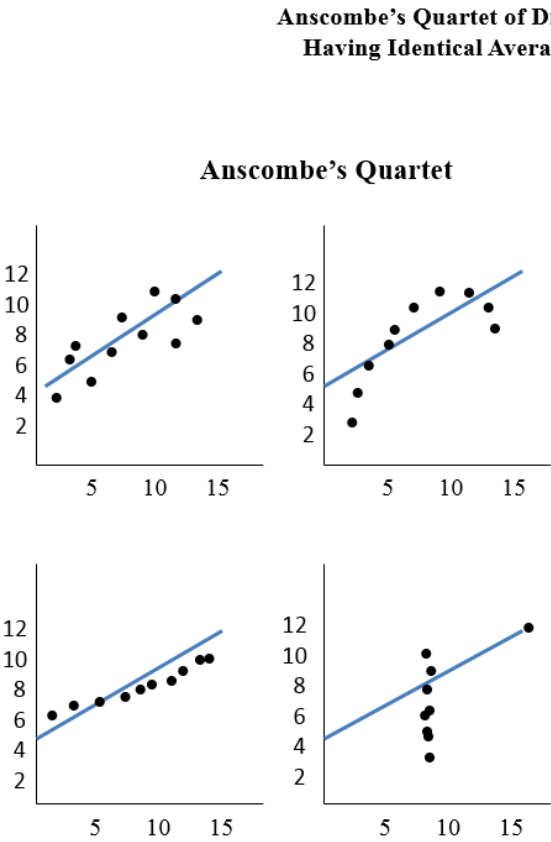
## References

- Acquaah, M. & Yasai-Ardekani, M. (2008). Does the implementation of a combination competitive strategy yield incremental performance benefits? A new perspective from a transition economy in Sub-Saharan Africa. *J Bus Res*, 61 (4), 346–354.
- Anscombe, F. (1973). Graphs in Statistical Analysis. *The American Statistician*, 17-21.
- Aulakh, P.S., Kotabe, M. & Teegen, H. (2000). Export Strategies and Performance of Firms from Emerging Economies: Evidence from Brazil, Chile, and Mexico. *The Acad of Manage J*, 43 (3), 342-361.
- Brenes, E. R., Montoya, D. & Ciravegna, L. (2014). Differentiation strategies in emerging markets: The case of Latin American agribusinesses. *Journal of Business Research*, 67(5), 847-855.
- Brenes, E. R., Ciravegna, L., & Montoya, D. (2015). Super Selectos: Winning the war against multinational retail chains. *Journal of Business Research*, 68(2), 216-224.
- Brenes, E.R., Mena, M. & Molina, G. (2008). Key success factors for strategy implementation in Latin America. *J Bus Res*, 61 (6), 590-598.
- Campbell-Hunt, C. (2000). What have we learned about generic competitive strategy? A meta-analysis. *Strategy Manage J*, 21, 127–154.
- Fiss, P. C. (2007). A set-theoretic approach to organizational configurations. *Academy of Management Review*, 32, 1180–1198.
- Fiss, P. C. (2011). Building better causal theories: A fuzzy set approach to typologies in organization research. *Academy of Management Journal*, 54, 393–420.

- Nicholls-Nixon, C.L., Davila, J.A., Sanchez, J. & Pesquera, M. R. (2011). Latin America Management Research: Review, Synthesis, and Extension. *J of Manage*, 37 [July], 1178-1227.
- Ragin, C. C. (2008). *Redesigning Social Inquiry: Fuzzy Sets and Beyond*. The University of Chicago Press.
- Ordanini, A. P. (2014). When the Recipe Is More Important Than the Ingredients: A Qualitative Comparative Analysis (QCA) of Service Innovation Configurations. *Journal of Service Research*, 134-149.
- Woodside, A. G., Schpektor, A., Xia, X. (2013). Triple sense-making of findings from marketing experiments using the dominant variable based-logic, case-based logic, and isomorphic modeling. *International Journal of Business and Economics*, 12, 131-153.



**Figure 1**  
**Anscombe's Quartet of Different XY Plots of Four Data Sets**  
**Having Identical Averages, Variances, and Correlations**

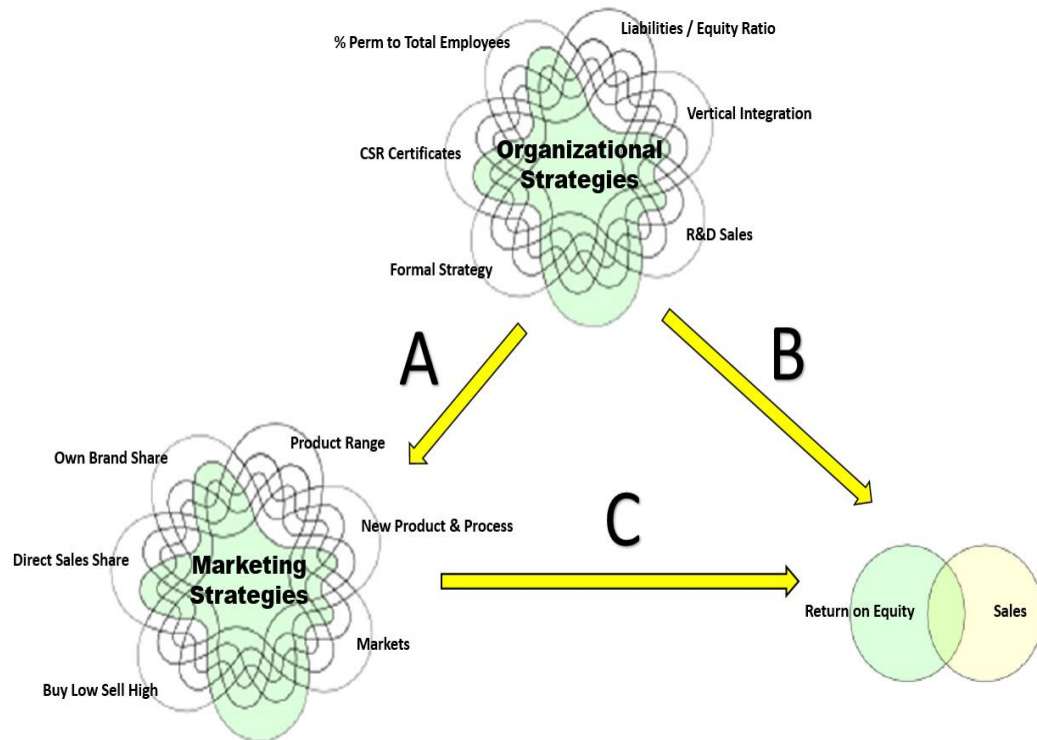


| Property             | Value                                   |
|----------------------|---|
| Mean of X (average)  | 9 in all 4 XY plots                     |
| Sample variance of X | 11 in all four XY plots                 |
| Mean of Y            | 7.50 in all 4 XY plots                  |
| Sample variance of Y | 4.122 or 4.127 in all 4 XY plots        |
| Correlation (r )     | 0.816 in all 4 XY plots                 |
| Linear regression    | $y = 3.00 + (0.500x)$ in all 4 XY plots |

**Data sets for the 4 XY plots**

| I    |       | II   |      | III  |       | IV   |       |
|------|-------|------|------|------|-------|------|-------|
| x    | y     | x    | y    | x    | y     | x    | y     |
| 10.0 | 8.04  | 10.0 | 9.14 | 10.0 | 7.46  | 8.0  | 6.58  |
| 8.0  | 6.95  | 8.0  | 8.14 | 8.0  | 6.77  | 8.0  | 5.76  |
| 13.0 | 7.58  | 13.0 | 8.74 | 13.0 | 12.74 | 8.0  | 5.76  |
| 9.0  | 8.81  | 9.0  | 8.77 | 9.0  | 7.11  | 8.0  | 8.84  |
| 11.0 | 8.33  | 11.0 | 9.26 | 11.0 | 8.81  | 8.0  | 8.47  |
| 14.0 | 9.96  | 14.0 | 8.10 | 14.0 | 8.84  | 8.0  | 7.04  |
| 6.0  | 7.24  | 6.0  | 6.13 | 6.0  | 6.08  | 8.0  | 5.25  |
| 4.0  | 4.26  | 4.0  | 3.10 | 4.0  | 5.39  | 19.0 | 12.50 |
| 12.0 | 10.84 | 12.0 | 7.26 | 12.0 | 8.15  | 8.0  | 5.56  |
| 7.0  | 4.82  | 7.0  | 7.26 | 7.0  | 6.42  | 8.0  | 7.91  |
| 5.0  | 5.68  | 5.0  | 4.74 | 5.0  | 5.73  | 8.0  | 6.89  |

Source: Adapted from Anscombe (1973, pp. 19-20)

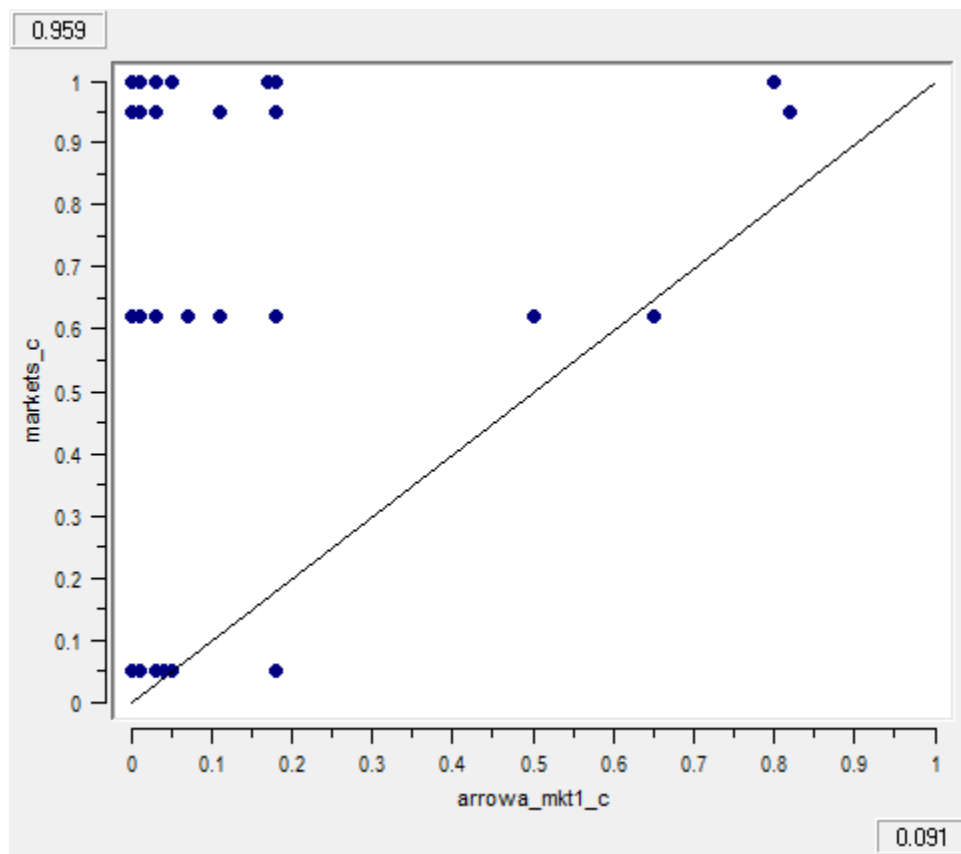


**Figure 2: The Model**

**Table 1: Findings for Arrow A: Outcome Markets**

\*The models appear vertically in the presentations

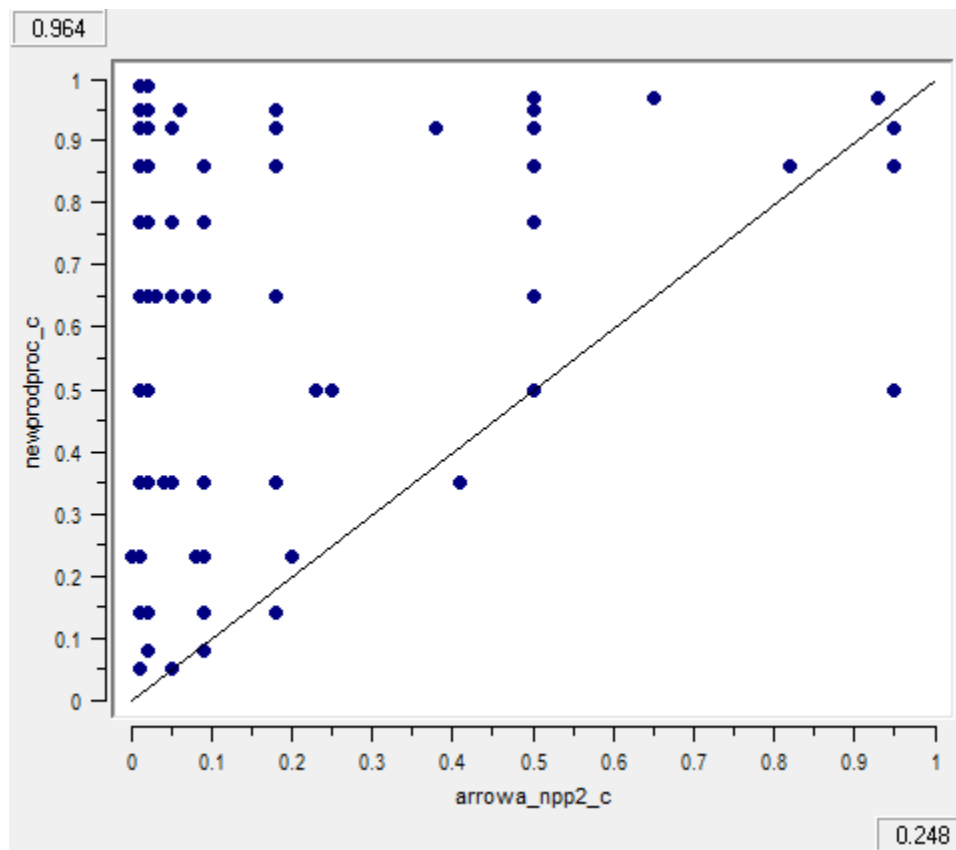
| <u>Antecedent</u> | <u>Description</u>                  | <u>MKTS 1</u> | <u>MKTS 2</u> | <u>MKTS 3</u> |
|-------------------|-------------------------------------|---------------|---------------|---------------|
| vert_int_c        | Vertical integration                | ○             | ○             | ●             |
| formal_strat_c    | Formal strategy                     | ○             | ●             | ○             |
| r_d_sales_c       | Proportion of R&D expenses to sales | ○             | ○             | ●             |
| liab_equit_c      | Debt to equity ratio                | ○             | ●             | ○             |
| permshare_c       | Percentage of permanent employees   | ○             | ○             | ○             |
| csr_certs_c       | Corporate social responsibility     |               | ○             | ●             |
| Raw Coverage      |                                     | 0.09          | 0.09          | 0.06          |
| Unique Coverage   |                                     | 0.06          | 0.08          | 0.03          |
| Consistency       |                                     | 0.96          | 0.96          | 0.96          |

**Figure 3: Arrow A with outcome Markets, model 1**

**Table 2: Findings for Arrow A: Outcome New Products & Processes**

\*The models appear vertically in the presentations

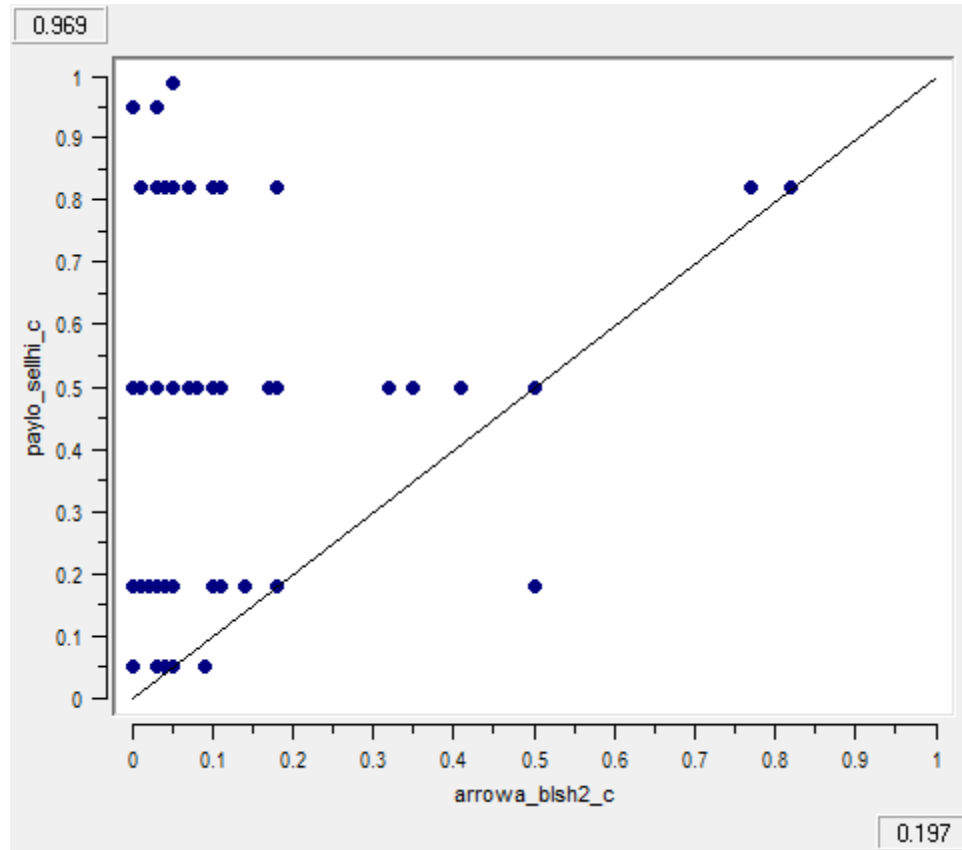
| <u>Antecedent</u> | <u>Description</u>                  | <u>NPNP 1</u> | <u>NPNP 2</u> | <u>NPNP 3</u> | <u>NPNP 4</u> |
|-------------------|-------------------------------------|---------------|---------------|---------------|---------------|
| vert_int_c        | Vertical integration                | ●             | ●             | ●             | ○             |
| formal_strat_c    | Formal strategy                     | ●             | ●             | ●             | ●             |
| r_d_sales_c       | Proportion of R&D expenses to sales | ●             | ○             | ●             | ●             |
| liab_equit_c      | Debt to equity ratio                | ○             | ●             | ●             | ○             |
| permshare_c       | Percentage of permanent employees   | ●             | ●             | ●             | ○             |
| csr_certs_c       | Corporate social responsibility     | ●             | ●             | ●             | ○             |
| Raw Coverage      |                                     | 0.18          | 0.25          | 0.16          | 0.08          |
| Unique Coverage   |                                     | 0.06          | 0.17          | 0.05          | 0.01          |
| Consistency       |                                     | 0.97          | 0.96          | 0.95          | 0.96          |

**Figure 4: Arrow A with outcome New Products & Processes, model 2**

**Table 3: Findings for Arrow A: Outcome Pay Low & Sell High**

\*The models appear vertically in the presentations

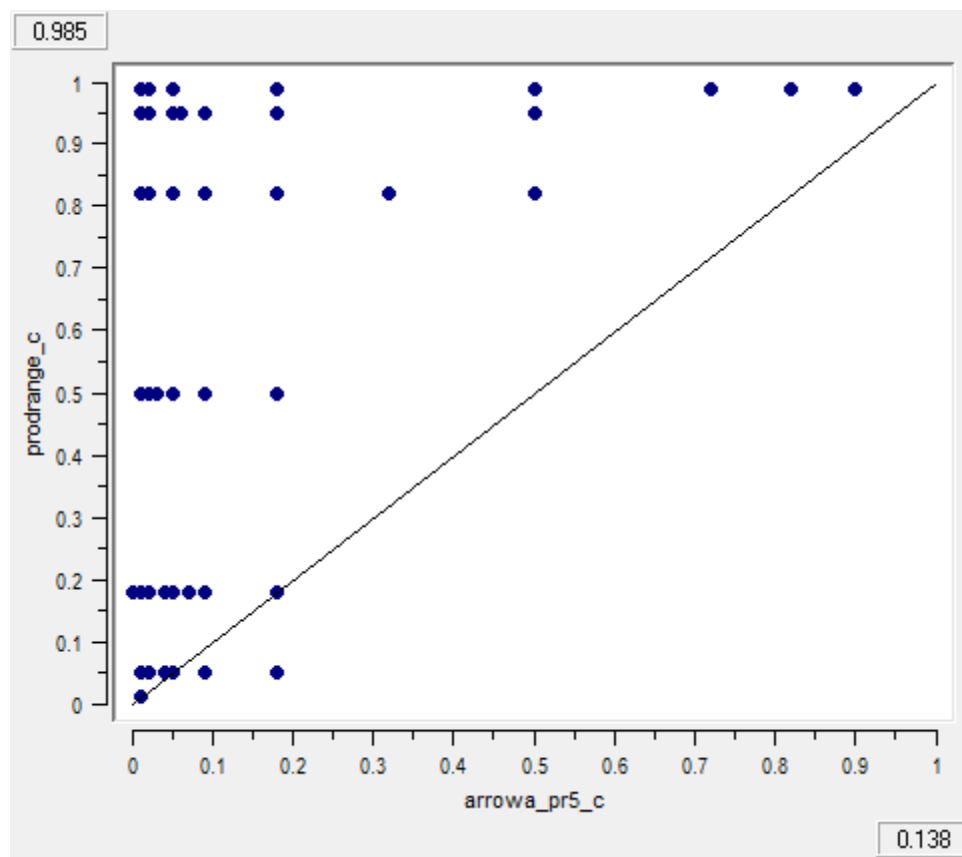
| <u>Antecedent</u> | <u>Description</u>                  | <u>PLSH 1</u> | <u>PLSH 2</u> | <u>PLSH 3</u> | <u>PLSH 4</u> |
|-------------------|-------------------------------------|---------------|---------------|---------------|---------------|
| vert_int_c        | Vertical integration                | ○             | ●             | ○             | ●             |
| formal_strat_c    | Formal strategy                     | ●             | ●             | ○             | ○             |
| r_d_sales_c       | Proportion of R&D expenses to sales | ●             | ●             | ○             | ○             |
| liab_equit_c      | Debt to equity ratio                | ○             | ○             | ●             | ○             |
| permshare_c       | Percentage of permanent employees   |               | ○             | ○             | ●             |
| csr_certs_c       | Corporate social responsibility     | ○             | ●             | ○             | ●             |
| Raw Coverage      |                                     | 0.18          | 0.25          | 0.16          | 0.08          |
| Unique Coverage   |                                     | 0.06          | 0.17          | 0.05          | 0.01          |
| Consistency       |                                     | 0.97          | 0.96          | 0.95          | 0.96          |

**Figure 5: Arrow A with outcome Pay Low & Sell High, model 2**

**Table 4: Findings for Arrow A: Outcome Product Range**

\*The models appear vertically in the presentations

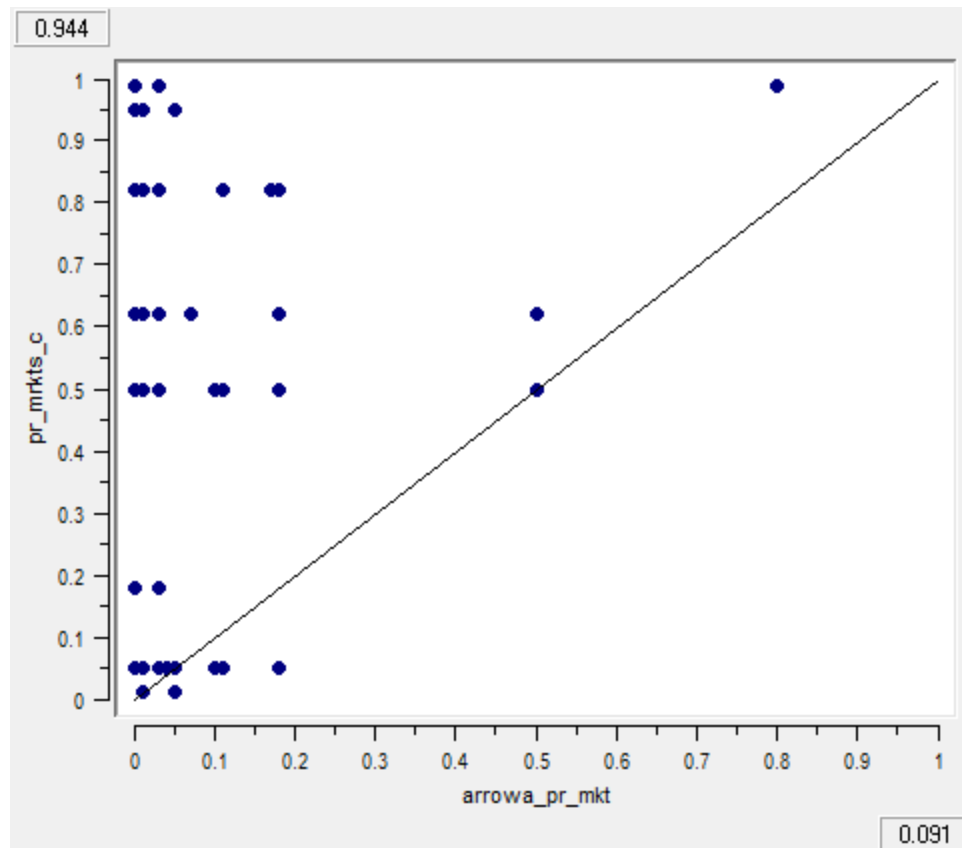
| <u>Antecedent</u> | <u>Description</u>                  | <u>PR 1</u> | <u>PR 2</u> | <u>PR 3</u> | <u>PR 4</u> | <u>PR 5</u> |
|-------------------|-------------------------------------|-------------|-------------|-------------|-------------|-------------|
| vert_int_c        | Vertical integration                | ●           | ●           | ●           | ○           | ●           |
| formal_strat_c    | Formal strategy                     | ●           | ●           | ○           | ○           | ●           |
| r_d_sales_c       | Proportion of R&D expenses to sales |             | ○           | ○           | ○           | ●           |
| liab_equit_c      | Debt to equity ratio                | ○           |             | ○           | ○           | ●           |
| permshare_c       | Percentage of permanent employees   | ○           | ○           | ○           | ○           | ●           |
| csr_certs_c       | Corporate social responsibility     | ●           | ●           | ○           | ●           | ●           |
| Raw Coverage      |                                     | 0.14        | 0.15        | 0.08        | 0.06        | 0.14        |
| Unique Coverage   |                                     | 0.03        | 0.04        | 0.03        | 0.02        | 0.07        |
| Consistency       |                                     | 0.97        | 0.94        | 0.96        | 0.95        | 0.98        |

**Figure 6: Arrow A with outcome Product Range, model 5**

**Table 5: Findings for Arrow A: Outcome Product Range & Markets (fuzzy-and)**

\*The models appear vertically in the presentations

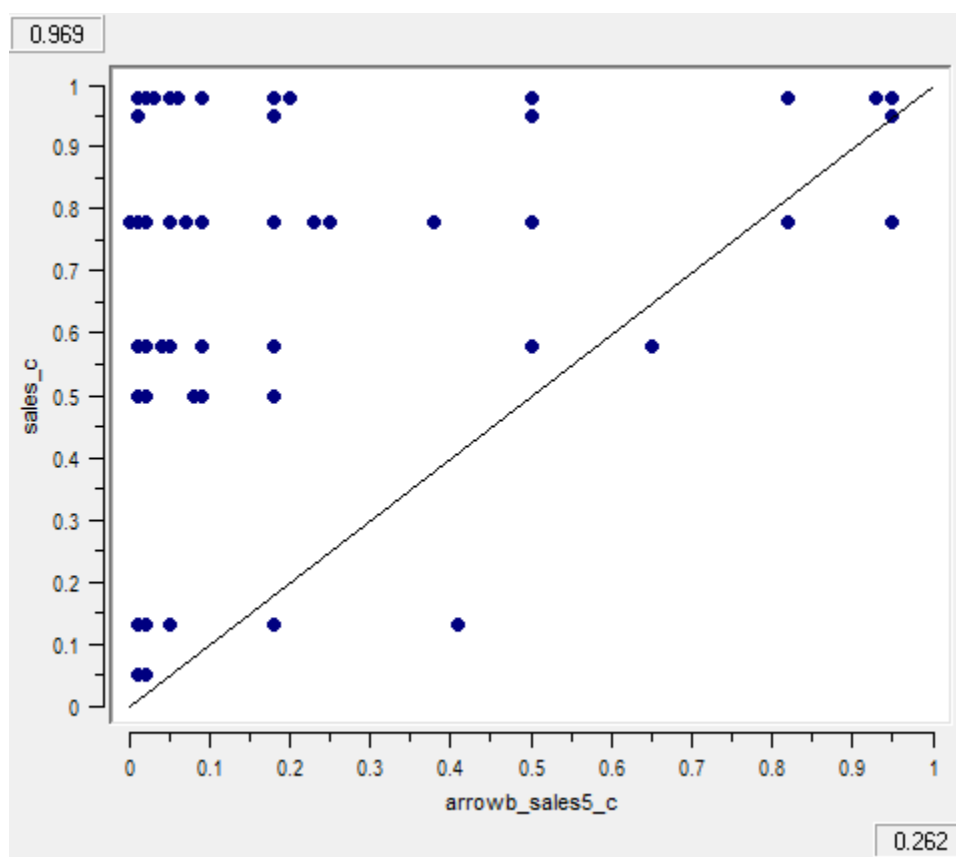
| <u>Antecedent</u> | <u>Description</u>                  | <u>PR•MKT 1</u> | <u>PR•MKT 2</u> |
|-------------------|-------------------------------------|-----------------|-----------------|
| vert_int_c        | Vertical integration                | ○               | ●               |
| formal_strat_c    | Formal strategy                     | ○               | ○               |
| r_d_sales_c       | Proportion of R&D expenses to sales | ○               | ●               |
| liab_equit_c      | Debt to equity ratio                | ○               | ○               |
| permshare_c       | Percentage of permanent employees   | ○               | ○               |
| csr_certs_c       | Corporate social responsibility     | ●               | ●               |
| Raw Coverage      |                                     | 0.09            | 0.08            |
| Unique Coverage   |                                     | 0.05            | 0.03            |
| Consistency       |                                     | 0.94            | 0.87            |

**Figure 7: Arrow A with outcome Product Range & Markets (Fuzzyand), model 1**

**Table 6: Findings for Arrow B: Outcome Sales**

\*The models appear vertically in the presentations

| Antecedent     | Description                         | SALES 1 | SALES 2 | SALES 3 | SALES 4 | SALES 5 | SALES 6 | SALES 7 |
|----------------|-------------------------------------|---------|---------|---------|---------|---------|---------|---------|
| vert_int_c     | Vertical integration                | ●       | ●       | ●       | ●       | ●       | ○       | ○       |
| formal_strat_c | Formal strategy                     | ●       | ●       | ●       | ●       | ●       | ●       | ●       |
| r_d_sales_c    | Proportion of R&D expenses to sales | ○       | ○       | ○       | ●       | ○       | ●       | ●       |
| liab_equit_c   | Debt to equity ratio                | ○       | ○       | ○       | ○       | ●       | ●       | ○       |
| permshare_c    | Percentage of permanent employees   | ○       | ○       | ○       | ○       | ●       | ●       | ●       |
| csr_certs_c    | Corporate social responsibility     | ●       | ●       | ●       | ●       | ●       | ●       | ○       |
|                | Raw Coverage                        | 0.29    | 0.38    | 0.12    | 0.15    | 0.26    | 0.18    | 0.09    |
|                | Unique Coverage                     | 0.04    | 0.04    | 0.01    | 0.07    | 0.03    | 0.05    | 0.01    |
|                | Consistency                         | 0.94    | 0.96    | 0.96    | 0.95    | 0.97    | 0.96    | 0.92    |

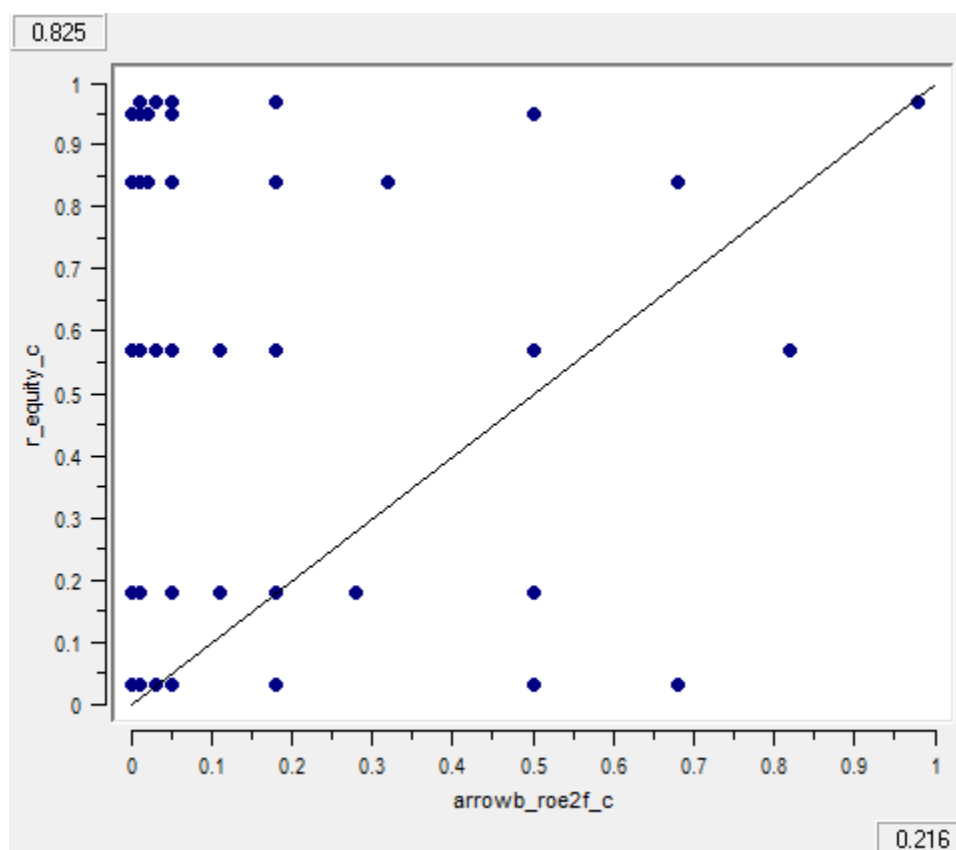
**Figure 8: Arrow B outcome Sales, model 5**



**Table 7: Findings for Arrow B: Outcome ROE**

\*The models appear vertically in the presentations

| <u>Antecedent</u> | <u>Description</u>                  | <u>ROE 1</u> | <u>ROE 2</u> | <u>ROE 3</u> | <u>ROE 4</u> | <u>ROE 5</u> | <u>ROE 6</u> |
|-------------------|-------------------------------------|--------------|--------------|--------------|--------------|--------------|--------------|
| vert_int_c        | Vertical integration                | ●            | ●            | ○            | ○            | ●            | ○            |
| formal_strat_c    | Formal strategy                     | ●            | ●            | ○            | ●            | ○            | ●            |
| r_d_sales_c       | Proportion of R&D expenses to sales | ○            | ●            | ○            | ●            | ●            | ●            |
| liab_equit_c      | Debt to equity ratio                | ○            | ○            | ●            | ○            | ○            | ●            |
| permshare_c       | Percentage of permanent employees   | ○            | ○            | ○            | ○            | ●            | ●            |
| csr_certs_c       | Corporate social responsibility     | ●            | ●            | ○            | ○            | ○            | ●            |
|                   | Raw Coverage                        | 0.17         | 0.22         | 0.06         | 0.11         | 0.07         | 0.12         |
|                   | Unique Coverage                     | 0.03         | 0.06         | 0.04         | 0.01         | 0.04         | 0.03         |
|                   | Consistency                         | 0.81         | 0.82         | 0.82         | 0.84         | 0.82         | 0.83         |

**Figure 9: Arrow B outcome ROE, model 2**

**Figure 10: Findings for Arrow B: Outcome Negation of ROE & Negation of Sales**

\*The models appear vertically in the presentations

| <u>Antecedent</u> | <u>Description</u>                  | <u>~ROE • ~SALES1</u> | <u>~ROE • ~SALES2</u> |
|-------------------|-------------------------------------|-----------------------|-----------------------|
| vert_int_c        | Vertical integration                | ○                     | ○                     |
| formal_strat_c    | Formal strategy                     | ○                     | ●                     |
| r_d_sales_c       | Proportion of R&D expenses to sales | ○                     | ●                     |
| liab_equit_c      | Debt to equity ratio                | ○                     | ○                     |
| permshare_c       | Percentage of permanent employees   | ○                     | ○                     |
| csr_certs_c       | Corporate social responsibility     | ○                     | ○                     |
| Raw Coverage      |                                     | 0.12                  | 0.13                  |
| Unique Coverage   |                                     | 0.12                  | 0.11                  |
| Consistency       |                                     | 0.81                  | 0.85                  |

**Figure 11: Findings for Arrow B: Outcome Sales & ROE**

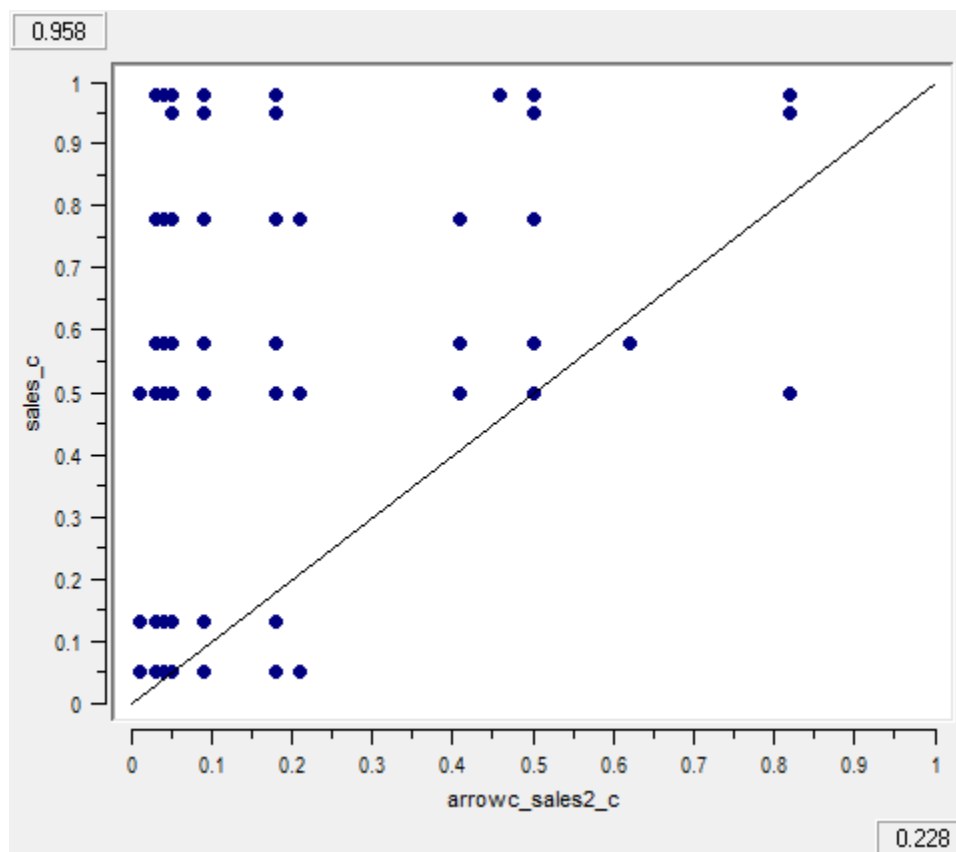
\*The presentation below is the Complex Solution resulting from an fsQCA analysis

| <u>Antecedent</u> | <u>Description</u>                  | <u>ROE • SALES1</u> | <u>ROE • SALES2</u> | <u>ROE • SALES3</u> | <u>ROE • SALES4</u> | <u>ROE • SALES5</u> | <u>ROE • SALES6</u> |
|-------------------|-------------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| vert_int_c        | Vertical integration                | ●                   | ●                   |                     | ○                   |                     | ○                   |
| formal_strat_c    | Formal strategy                     | ●                   | ●                   | ●                   | ●                   | ●                   | ●                   |
| r_d_sales_c       | Proportion of R&D expenses to sales | ○                   |                     | ○                   | ●                   | ○                   | ●                   |
| liab_equit_c      | Debt to equity ratio                |                     | ○                   | ○                   | ○                   | ●                   | ●                   |
| permshare_c       | Percentage of permanent employees   | ○                   |                     | ○                   |                     | ○                   | ●                   |
| csr_certs_c       | Corporate social responsibility     |                     | ●                   | ●                   | ○                   | ○                   | ●                   |
| Raw Coverage      |                                     | 0.24                | 0.42                | 0.20                | 0.16                | 0.15                | 0.22                |
| Unique Coverage   |                                     | 0.03                | 0.16                | 0.02                | 0.00                | 0.00                | 0.04                |
| Consistency       |                                     | 0.64                | 0.63                | 0.70                | 0.70                | 0.61                | 0.67                |

**Table 8: Findings for Arrow C: Outcome Sales**

\*The models appear vertically in the presentations

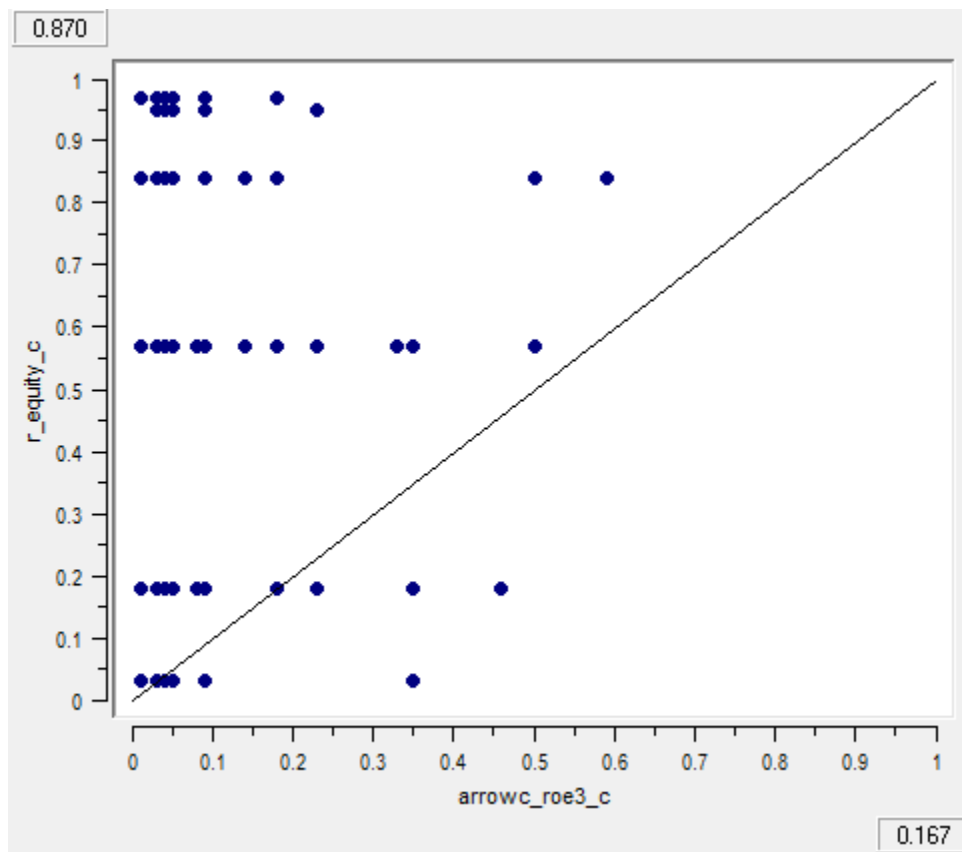
| <u>Antecedent</u> | <u>Description</u>                                | <u>SALES 1</u> | <u>SALES 2</u> | <u>SALES 3</u> | <u>SALES 4</u> |
|-------------------|---|----------------|----------------|----------------|----------------|
| prodrange_c       | Product range relative to competition             | ●              | ●              | ●              | ●              |
| newprodproc_c     | New products & processes relative to competition  | ●              |                | ●              |                |
| direct_share_c    | Proportion of sales sold directly to end customer |                | ○              | ○              | ●              |
| ownbrand_shar_c   | Proportion of sales from their own brand          |                | ●              | ●              | ●              |
| paylo_sellhi_c    | Paying low for cost of goods and selling high     | ●              | ○              | ●              | ●              |
| markets_c         | Number of markets                                 | ●              | ●              |                | ●              |
| Raw Coverage      |   | 0.40           | 0.23           | 0.27           | 0.19           |
| Unique Coverage   |   | 0.13           | 0.04           | 0.03           | 0.01           |
| Consistency       |   | 0.90           | 0.96           | 0.95           | 0.94           |

**Figure 12: Arrow C outcome sales, model 2**

**Table 9: Findings for Arrow C: Outcome ROE**

\*The Models appear vertically in the presentations

| <u>Antecedent</u> | <u>Description</u>                                | <u>ROE 1</u> | <u>ROE 2</u> | <u>ROE 3</u> |
|-------------------|---|--------------|--------------|--------------|
| prodrange_c       | Product range relative to competition             | ●            | ○            | ●            |
| newprodproc_c     | New products & processes relative to competition  | ○            | ●            | ○            |
| direct_share_c    | Proportion of sales sold directly to end customer | ○            | ○            | ●            |
| ownbrand_shar_c   | Proportion of sales from their own brand          | ●            | ●            | ●            |
| paylo_sellhi_c    | Paying low for cost of goods and selling high     | ○            | ○            | ●            |
| markets_c         | Number of markets                                 | ●            | ●            | ●            |
| Raw Coverage      |   | 0.19         | 0.18         | 0.17         |
| Unique Coverage   |   | 0.03         | 0.06         | 0.04         |
| Consistency       |   | 0.87         | 0.86         | 0.87         |

**Figure 13: Arrow C outcome ROE, model 3**

**Table 10: Arrow C: Outcome Negation of ROE & Negation of Sales**

\*The Models appear vertically in the presentations

| <u>Antecedent</u> | <u>Description</u>                                | <u>~ROE • ~SALES1</u> |
|-------------------|---|-----------------------|
| prodrange_c       | Product range relative to competition             | ○                     |
| newprodproc_c     | New products & processes relative to competition  | ○                     |
| direct_share_c    | Proportion of sales sold directly to end customer | ●                     |
| ownbrand_shar_c   | Proportion of sales from their own brand          | ●                     |
| paylo_sellhi_c    | Paying low for cost of goods and selling high     | ○                     |
| markets_c         | Number of markets                                 | ○                     |
| Raw Coverage      |   | 0.17                  |
| Unique Coverage   |   | 0.17                  |
| Consistency       |   | 0.80                  |

**Table 11: Arrow C: Outcome Sales & ROE**

\*The Models appear vertically in the presentations

| <u>Antecedent</u> | <u>Description</u>                                | <u>ROE • SALES1</u> | <u>ROE • SALES2</u> |
|-------------------|---|---------------------|---------------------|
| prodrange_c       | Product range relative to competition             | ●                   | ●                   |
| newprodproc_c     | New products & processes relative to competition  | ○                   | ○                   |
| direct_share_c    | Proportion of sales sold directly to end customer | ○                   | ●                   |
| ownbrand_shar_c   | Proportion of sales from their own brand          | ●                   | ●                   |
| paylo_sellhi_c    | Paying low for cost of goods and selling high     | ○                   | ●                   |
| markets_c         | Number of markets                                 | ●                   | ●                   |
| Raw Coverage      |   | 0.26                | 0.23                |
| Unique Coverage   |   | 0.08                | 0.05                |
| Consistency       |   | 0.86                | 0.86                |

